CALFED BAY-DELTA PROGRAM

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SUMMARY OF RESTORATION AND MANAGEMENT PLANS PERTAINING TO THE ECOLOGICAL RESOURCES OF THE BAY-DELTA AND ITS WATERSHED

DECEMBER 1996

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SUMMARY OF ECOSYSTEM RESTORATION PLANS PERTAINING TO THE ECOLOGICAL RESOURCES OF THE BAY-DELTA AND ITS WATERSHED

INTRODUCTION

The mission of the CALFED Bay-Delta Program (CALFED) is to develop a long-term comprehensive plan to restore ecosystem health and improve water management for beneficial uses of the Bay-Delta System. CALFED staff has identified three alternatives that include a range of water storage options and differ in their water conveyance systems. Each alternative shares a common program that includes water use efficiency measures, ecosystem restoration, water quality protection, and levee improvements. CALFED staff is developing an Ecosystem Restoration Program Plan (ERPP) to define the Ecosystem Restoration Common Program component. The goal of ERPP is to improve and increase aquatic and terrestrial habitats and improve ecosystem functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.

The first step in ERPP development was identifying a preliminary list of ecosystem elements for which program implementation objectives and targets would be established. A program work team of resource experts was assembled from CALFED staff and consultants. The work team sought information from technical experts from agencies and stakeholders to assemble a list of draft ecosystem elements that would be addressed in ERPP. The work team reviewed existing information to document recommendations made by others whose goals were to restore or recover important habitat types and associated plants and animals, listed species, and fish and wildlife that have high commercial and recreational value. This existing information, together with information provided by resource agency staff and stakeholders, formed the basis by which the work team developed preliminary draft implementation objectives and targets.

This report presents summaries of documents relevant to CALFED and reviewed by the ERPP work team. These summaries provide a common reference point for CALFED, agencies, and stakeholders in relation to previous ecosystem restoration planning or implementation documents. In addition to providing guidance in formulation of implementation objectives and targets, the summaries also provide information that will prove useful for development of program actions to implement targets and the subsequent ERPP implementation plan. Four broad categories of documents are summarized:

- species listing proposals/petitions,
- species management plans,
- species recovery plans, and

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- habitat management plans.

Summaries include, if provided, descriptions of each document's:

- geographic scope;
- purpose;
- management recommendations;
- funding sources;
- status of implementation of recommendations;
- relationship to other planning documents;
- contact person, agency, or organization; and
- document citation.

The documents reviewed do not represent all plans that could provide important guidance for developing program implementation objectives and targets. Consequently, the work team will continue to review documents throughout the ERPP development process.

ANALYSIS AND PROJECT PROPOSAL TO FACILITATE DESIGN AND ENGINEERING TO CORRECT BUTTE CREEK SALMON MIGRATION PROBLEMS

GEOGRAPHIC SCOPE: Sacramento River Basin, Butte Creek.

PURPOSE: The decline of Butte Creek chinook salmon and steelhead populations has been attributed to several instream deficiencies including inadequate flows, unscreened diversions, and inadequate passage over diversion dams. The purpose of this proposal is to correct these deficiencies and increase overall smolt production from Butte Creek.

RECOMMENDATIONS: The proposed project will facilitate immediate design and 1997 construction of structures to improve fish passage at three critical Butte Creek problem locations. The specific corrective actions in the proposal include conducting feasibility/engineering activities at the high-priority fish passage sites (Adams, Gorrill, and Durham-Mutual Dams) and engineering state-of-the-art fish ladders at these sites. These actions have also been identified and discussed in DFG's 1993 report *Restoring Central Valley Streams: A Plan for Action* and USFWS' 1995 draft *Anadromous Fish Restoration Plan.* Refer to the summaries of these reports presented above for further discussion of goals and targets.

FUNDING: CVPIA, Category III, and Four Pumps Agreement funds

STATUS OF IMPLEMENTATION: In progress

RELATIONSHIP TO OTHER PLANS: Includes many goals and actions that were described in DFG's 1993 report *Restoring Central Valley Streams: A Plan for Action* and the USFWS' 1995 draft Anadromous Fish Restoration Plan.

RECOMMENDATIONS FOR THE RECOVERY OF THE SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON, NATIONAL MARINE FISHERIES SERVICE, SOUTHWEST REGION. MARCH 8, 1996

GEOGRAPHIC SCOPE: Sacramento River.

PURPOSE: The purpose of the report is to provide recommendations on how to restore winter-run chinook salmon population to the Sacramento River.

RECOMMENDATIONS:

- The mean annual spawning abundance over 13 consecutive years shall be 10,000 females.
- Preserve and restore riparian habitat and meander belts along the Sacramento River and the Sacramento-San Joaquin Delta.
- Develop and implement a Sacramento River and Delta riparian habitat restoration and management plan.
- Protect and maintain gravel resources in the Sacramento River and its tributaries between Keswick and Red Bluff.
- Preserve and restore tidal marsh habitat.
- Reduce pollution in the Sacramento River from Iron Mountain Mine.
- Reduce pollution from industrial, municipal, and agricultural sources.
- Reduce habitat loss, entrainment, and pollution from dredging and dredge disposal operations.
- Provide suitable water quality in the Sacramento River watershed and the Sacramento-San Joaquin Delta and the San Francisco Bay-Estuary.
- Install temperature control device at Shasta Dam in conjunction with modifications to CVP operations.
- Operate and maintain temperature control curtains as permanent installations in Whisketown and Lewiston Reservoirs; investigate installation of additional temperature curtain on the upstream side of Lewiston.
- Modify Anderson Cottonwood Irrigation District (ACID) diversion dam.

- Maintain flows in the Sacramento River of 5,000 to 5,500 cfs from October through April. Develop, implement, and monitor final instream flow recommendations and ramping rates for the upper Sacramento River.

FUNDING: None.

STATUS OF IMPLEMENTATION: Not Applicable.

RELATIONSHIP TO OTHER PLANS: National Marine Fisheries Services (NMFS) Biological Opinion for Sacramento River Winter-Run Chinook Salmon.

STATUS OF ACTIONS TO RESTORE CENTRAL VALLEY SPRING-RUN CHINOOK SALMON - A SPECIAL REPORT TO THE FISH AND GAME COMMISSION. FEBRUARY 1996

GEOGRAPHIC SCOPE: Northern California streams.

PURPOSE: The purpose of this report was to inform the Fish and Game Commission of the measures needed to restore and maintain spring-run chinook salmon populations in northern California streams.

RECOMMENDATIONS: This report provides a concise listing of the status of 166 habitat restoration projects, administrative actions, and evaluation studies that have been identified as necessary to protect, maintain, and restore spring-run chinook salmon populations in the Central Valley. Many of the recommendations for steelhead are linked to DFG's 1993 report *Restoring Central Valley Streams* and USFWS *AFRP*. Please refer to the goals in those reports for a complete discussion.

TARGETS:

FISH POPULATIONS:

HABITAT RESTORATION:

STRUCTURAL:

FLOW-RELATED:

JUSTIFICATION: The plan was prepared in response to the potential listing of the spring-run salmon under the California and federal Endangered Species Acts.

CRITERIA: None.

FUNDING: None.

STATUS OF IMPLEMENTATION: Not Applicable.

RELATIONSHIP TO OTHER PLANS: None.

STEELHEAD RESTORATION AND MANAGEMENT PLAN FOR CALIFORNIA, DFG, FEBRUARY 1996

GEOGRAPHIC SCOPE: North Coast, Central Valley, and South Coast regional streams.

PURPOSE: The purpose of the plan is to ensure the maintenance, restoration, and enhancement of California's steelhead stock. The project is responsible for statewide coordination of DFG's steelhead management, research, and restoration activities. A high priority of the project is the development and implementation of the Steelhead Restoration and Management Plan. The document provides guidelines for steelhead restoration and management to be integrated into current and future planning processes for specific river and stream systems.

TARGETS:

FISH POPULATIONS:

- Conduct summer adult steelhead surveys.
- Assess steelhead population, habitat, and fishery, Smith River.

HABITAT RESTORATION:

- Suction dredge mining should be discouraged in steelhead holding areas; operating plans and performance bonds for all mining operations should be required.
- Locate habitat disturbances and potential fish barriers.
- South Fork Trinity River - adopt best management practices such as deferring from harvest sensitive or unstable inner gorge slopes; implement 100-to-150-foot-wide stream management zones; selective harvest and special road location and construction techniques for timber stands that drain directly into steep, unstable inner gorge slopes; define, map and appropriately manage "sensitive lands"; timber harvest practices on private land should be reformed; increase efficiency of agricultural water use; perform a road inventory; implement riparian restoration for areas on Hayfork and tributaries damaged by grazing.
- Redwood Creek - accelerate restoration activities in upper watershed; remove levees from within the estuary; study the effects of summer dams.
- Eel River - Study the potential for chemically treating the upper Eel River drainage above Van Arsdale Reservoir should be investigated.

RECOVERY PLAN FOR THE SACRAMENTO-SAN JOAQUIN DELTA NATIVE FISHES.

USFWS Technical/Agency Draft, December 8, 1994

GEOGRAPHIC SCOPE: San Francisco Bay and Sacramento-San Joaquin Delta

PURPOSE: This recovery plan for native fishes is intended to provide a means for the conservation of ecosystems on which endangered and threatened species depend. The basic objective of the recovery plan is to establish self-sustaining populations of the species of concern that will persist indefinitely. The purpose of the recovery plan is to outline a strategy for the conservation and restoration of the Sacramento-San Joaquin Delta that currently supports or has the potential to support Delta native fishes. Eight species of concern are included in the recovery plan: Delta smelt, longfin smelt, Sacramento splittail, green sturgeon, Sacramento spring-run chinook salmon, Sacramento late fall-run chinook salmon, San Joaquin fall-run chinook salmon, and Sacramento perch.

RECOMMENDATIONS: The recovery plan goals include delisting of the delta smelt and splittail and restoration of longfin smelt; green sturgeon; spring-run, late fall-run, and San Joaquin fall-run chinook salmon. The plan includes quantifiable and specific criteria to: 1) monitor effectiveness of recovery actions, 2) determine when a species has recovered to a secure level (stabilized), and 3) determine when a species qualifies for delisting. The focus is on reestablishing identified population abundance and distribution levels. For each species, a historic base period was established using data to characterize abundance and distribution during a predecline period. The time period over which abundance and distribution criteria must be met was five generations. For five of the species, there is an additional requirement of meeting the criteria over a minimum number of years of stressful environmental conditions.

TARGETS:

FISH POPULATIONS: Individual species' abundance and distribution levels were described and set using data from a selected reference period and geographic area. Reference data were presented in tables and graphics for each species of concern. Other actions related to fish population targets included reducing the effects of introduced aquatic species on Delta native fishes, reducing the effects of harvest, and conducting monitoring and research on fish biology and management requirements.

HABITAT RESTORATION: Improve in-Delta and downstream-of-Delta habitat conditions, reduce entrainment losses to water diversions, reduce the effects of dredging and contaminants, and develop shallow-water habitat, riparian vegetation zones, and tidal marsh within the Delta.

STRUCTURAL: Screen diversions at the Contra Costa Water District Rock Slough intake.

ANADROMOUS FISH RESTORATION PLAN (AFRP)
A PLAN TO INCREASE NATURAL PRODUCTION OF ANADROMOUS FISH IN THE CENTRAL VALLEY OF CALIFORNIA
DECEMBER 6, 1995

GEOGRAPHIC SCOPE: Central Valley.

PURPOSE: The purpose of AFRP is to fulfill the goals established in the Central Valley Project Improvement Act (CVPIA), which directs the Secretary of the Interior to develop and implement a program that makes all reasonable efforts to ensure that, by 2002, natural production of anadromous fish in the Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained from 1967 to 1991. The restoration plan provides a list of actions considered by U.S. Fish and Wildlife Service to be reasonable and identifies those that are underway or likely to be implemented in 1996. The plan also includes a process to implement actions.

RECOMMENDATIONS: AFRP contains many population, habitat, structural, flow targets, and goals for specific watersheds. One hundred seventy-six actions and 109 evaluations were identified in AFRP. The legislative actions, as described in CVPIA, are summarized in the following four categories.

TARGETS:

FISH POPULATIONS:

- Mitigate for Tracy Pumping Plant operations.
- Mitigate for Contra Costa Pumping Plant operations.

HABITAT RESTORATION:

- Replenish spawning gravels and restore riparian habitat below Shasta, Folsom, and New Melones Reservoirs.

STRUCTURAL:

- Install temperature control device at Shasta Dam.
- Implement Coleman National Fish Hatchery Plan and modify Keswick Dam Fish Trap.
- Install new control structures at the Delta Cross Channel and Georgiana Slough.

- Construct, in cooperation with the State and in consultation with local interests, a seasonally operated barrier at the head of Old River.

- Resolve fish passage and stranding problems at ACID diversion dam.

- Assist State in efforts to avoid losses of juvenile anadromous fish resulting from unscreened or inadequately screened diversions.

- Minimize fish passage problems at Red Bluff diversion dam.

FLOW-RELATED:

- Acquire water to supplement the quantity of water dedicated for fish and wildlife water needs under CVPIA sections 3406(b)(2) and 3406(b)(3).

- Meet flow standards that apply to the (CVP).

- Use pulse flows to increase migratory fish survival.

- Eliminate fish losses from flow fluctuations of the CVP.

- Provide increased flows and improve fish passage and restore habitat in Clear Creek.

- Reevaluate carryover storage criteria for reservoirs on the Sacramento and Trinity Rivers.

JUSTIFICATION: Central Valley Project Improvement Act.

CRITERIA: None.

FUNDING: The Central Valley Project Imporvement Act.

STATUS OF IMPLEMENTATION: In progress.

RELATIONSHIP TO OTHER PLANS: Includes some of the goals and actions in California Department of Fish and Game's (DFG's) *Restoring Central Valley Streams A Plan for Action.*

ANADROMOUS FISH RESTORATION PROGRAM PLAN (DRAFT)

GEOGRAPHIC SCOPE: Central Valley.

PURPOSE: The Anadromous Fish Restoration Program Plan was developed to satisfy the direction by the Secretary of Interior "...to develop and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991".

RECOMMENDATIONS: Six objectives were outlined as important to achieving the above purpose. Only the terrestrial objectives are discussed below.

Targets/Objectives: 1) Improve stream habitat for all life stages of anadromous fish through improved flows, water quality, and physical structure; and 2) integrate habitat restoration efforts with harvest and hatchery management. Specific terrestrial actions identified under these objectives are:

- Fence select riparian corridors within the Cow Creek watershed to exclude livestock.
- Maintain and restore the riparian habitat along the lower reaches of Mill Creek.
- Employ the most ecologically sound timber extraction practices by implementing the forest plan on federal lands within the Thomes Creek drainage.
- Modify and employ the most ecologically sound grazing practices by implementing the forest plan on federal lands within the Thomes Creek drainage.
- Negotiate long-term agreements to maintain and restore riparian habitats along the lower reaches of Deer Creek.
- Cooperate with local landowners to encourage revegetation of denuded stream reaches and establish a protected riparian strip.
- Develop a watershed management program for the Butte Creek drainage.
- Develop a riparian corridor management plan to improve and protect riparian habitat and instream cover for the American River.
- Enhance and maintain the riparian corridor to improve streambank and channel rearing habitat for juvenile salmonids in the Mokelumne River.
- Establish a riparian corridor protection zone for the Consumes River.

GOALS FOR RESTORING A HEALTHY ESTUARY: REPORT ON RESULTS OF A WORKSHOP OF ESTUARINE SCIENTISTS. NATURAL HERITAGE INSTITUTE, OCTOBER 1995

GEOGRAPHIC SCOPE: San Francisco Bay and Delta.

PURPOSE: This short report summarizes the results of a workshop held on October 2, 1995 to develop goals for restoring a healthy estuary.

RECOMMENDATIONS: Specific geographic, species, or resource targets were not identified in the workshop report. Many of the goals recommended were global in concept and are provided here for information.

- Maintain sediment contamination at least below levels seen in 1950.
- Prevent conditions that result in water-column anoxia including harmful and nuisance algal blooms.
- Sustain natural evolution of baylands.
- Decrease turbidity of the water and increase seagrass habitat.

FUNDING: None.

STATUS OF IMPLEMENTATION: Not applicable.

RELATIONSHIP TO OTHER PLANS: None.

SOURCE: Natural Heritage Institute. 1995. Goals for restoring a healthy estuary: report on results of a workshop of estuarine scientists, October 2, 1995, Tiburon, CA. October 19, 1995. San Francisco, CA.

HABITAT MANAGEMENT PLAN FOR THE CANAL RANCH FISH AND WILDLIFE MANAGEMENT AREA

GEOGRAPHIC SCOPE: Canal Ranch, Sacramento-San Joaquin Delta.

PURPOSE: To increase benefits to water-dependent wildlife, develop riparian forest to benefit nesting Swainson's hawks and other neotropical migrants, improve waterside habitat for fish, and address fishery concerns related to entrainment of listed fish species in a manner that allows continued management of critical wetlands.

RECOMMENDATIONS: The creation of levees and water control structures outlined in the plan would result in approximately 2,700 acres of high-quality wildlife habitat. The mosaic of habitats and their proposed juxtaposition will result in an area that is beneficial to many fish and wildlife species including several special-status species.

FUNDING: Collaborative funding efforts among Canal Ranch Partners, L.L.C.; Department of Fish and Game; the Wildlife Conservation Board; the U.S. Fish and Wildlife Service; and the California Department of Water Resources.

STATUS OF IMPLEMENTATION: Canal Ranch Partners, L.L.C. anticipates that it will realistically take 5-7 years to effectively and efficiently implement the habitat management plan. Staging construction of the infrastructure will help reduce up-front, one-time capital costs to install the area's infrastructure. In addition, experience gained implementing earlier stages will help guide later stages.

RELATIONSHIP TO OTHER PLANS: Unknown.

CONTACT: California Department of Fish and Game, Bay Delta and Special Water Projects Division, 4001 North Wilson Way, Stockton, CA 95205. (209) 948-7800.

SOURCE: California Department of Fish and Game. 1996. Habitat management plan for the Canal Ranch fish and wildlife management area. Stockton, CA.

RESTORING CENTRAL VALLEY STREAMS - A PLAN FOR ACTION
CALIFORNIA DEPARTMENT OF FISH AND GAME
NOVEMBER 1993

GEOGRAPHIC SCOPE: Central Valley streams.

PURPOSE: The specific goals of this plan are to restore and protect threatened and endangered species. This would implement the State-legislated policy to double populations of anadromous fish in California.

RECOMMENDATIONS: The DFG document identifies specific actions for various streams in the report that were classified into the four categories below.

TARGETS:

FISH POPULATIONS:

- Antelope Creek - 3,000 fall-run and 2,000 spring-run.

HABITAT RESTORATION:

- Restore spawning gravels in North Fork Battle Creek.
- Big Chico Creek - eliminate siltation problems at One-Mile Dam.
- Butte Creek - improve spawning and rearing habitat.

STRUCTURAL:

- Battle Creek - install fish screens on agricultural diversion and all unscreened hydropower diversions;
- Battle Creek - install effective water treatment system.
- Bear Creek - install fish screens on all major water diversions.
- Big Chico Creek - Relocate M&T pump station; repair or rebuild water control structures at Five-Mile Dam and Lindo Channel; inspect/repair existing fish ladders; reestablish the Upper Bidwell Park U.S. Geological Society (USGS) streamflow gage. Install water temperature thermograph.

THE NATURE CONSERVANCY'S BIOLOGICAL SCOPING PROJECT FOR THE SACRAMENTO VALLEY AND FOOTHILL BIOREGION

GEOGRAPHIC SCOPE: The Sacramento Valley and adjoining foothills.

PURPOSE: The Nature Conservancy (TNC) is to conduct a course-level analysis that is designed to identify highest priority ecological resources within the bioregion of Sacramento Valley and adjoining foothills. The primary purpose is to identify outstanding sites representing the full spectrum of threatened natural communities and endangered species of the project area.

RECOMMENDATIONS: The Sacramento Valley and Foothill Bioregion Biological Scoping Project provides a framework for the Nature Conservancy's internal long range planning process. The implementation of such a plan will encompass approximately 1.3 million acres and approximately 780 stream miles of core habitat. The goals and conclusions of TNC via this biological scoping project are:

- Protection of existing and restorable riparian and aquatic systems and related endangered species of the main-stem Sacramento River.
- Maintain bioregional fish and wildlife movement and hydrological integrity by protecting tributary ecosystems having extremely high quality riparian and aquatic habitats.
- Protect interconnected habitats of vernal pools, wildflower fields, blue oak woodlands, riparian corridors, and associated rare species for the maintenance of a natural community mosaic.
- Protect the full spectrum of vernal pool types of the Sacramento Valley.
- Protect all wetland basins considered critical to maintaining viable populations of wintering waterfowl and associated endangered wetland species of the Sacramento Valley.

FUNDING: Not Applicable

STATUS OF IMPLEMENTATION: On going. The results of the analysis will be refined and updated as new biological information becomes available and upon completion of an assessment of threats and opportunities.

RELATIONSHIP TO OTHER PLANS: None stated, although is indirectly related to many similar efforts.

CONTACT: The Nature Conservancy.

THE NATURE CONSERVANCY'S SACRAMENTO RIVER PROJECT

GEOGRAPHIC SCOPE: Sacramento River between Red Bluff and Colusa.

PURPOSE: To protect and restore flood-prone land along the Sacramento River. The project involves riparian protection, restoration, and sustainable agriculture. By working with a number of public and private partners along the river's main stem, TNC seeks to develop and demonstrate examples of successfully integrated land use. Biologically and economically feasible methods of restoration are being explored and the focus is on the development of large-scale, cost-effective riparian restoration techniques that can be demonstrated to other landowners and managers interested in implementing riparian restoration. Wildlife utilization of restoration sites is also being evaluated. Restoration manuals have been prepared which outline the tools and techniques for riparian restoration.

RECOMMENDATIONS: TNC's Sacramento River Project has planted 613 acres of riparian forest along the Sacramento River as of fall 1996. This acreage value does not include restoration occurring from mitigation by public agencies. TNC is actively acquiring flood-prone lands from willing sellers and working with public partners in order to restore riparian forest to create large contiguous blocks. Future acreage goals for restoration activities include at least 2,726 acres of publicly managed orchard and row crops.

FUNDING: The Nature Conservancy.

STATUS OF IMPLEMENTATION: On going. Several projects have been completed while others are in the early stages of restoration.

RELATIONSHIP TO OTHER PLANS: Information included in this summary was from a letter from TNC to the USFWS. The riparian restoration effort by TNC's Sacramento River Project is part of their state-wide program to acquire, protect, and restore unique biologically important communities.

CONTACT: Marlyce Myers. The Nature Conservancy. Northern California Area Office, 1330 21st Street, Suite 103, Sacramento, CA 95814. Tel. 916-449-2850.

SOURCE: The Nature Conservancy. 1996. The Nature Conservancy's Sacramento River Project.

UPPER SACRAMENTO RIVER FISHERIES AND RIPARIAN HABITAT MANAGEMENT PLAN

GEOGRAPHIC SCOPE: Upper Sacramento River from Keswik Dam to Verona.

PURPOSE: The purpose of the Sacramento River Riparian Habitat Plan (also known as part of Senate Bill 1086) is to "preserve remaining riparian habitat and reestablish a continuous riparian ecosystem along the Sacramento River between the mouth of the Feather River and Keswick Dam".

RECOMMENDATIONS: The plan identifies 22 action items; the first two deal with protection and restoration of riparian habitat on the main stem of the Sacramento River and its tributaries, and the other 20 deal with actions to resolve fishery problems on the main stem and its tributaries. There are four recommendations described in the management plan requisite to the action items, which, if implemented, could enhance the probability of doubling the anadromous fisheries in the Sacramento River.

- State and federal legislation should be enacted as soon as possible to provide authority and funding needed to implement the actions contained in this management plan.
- The State of California should commit the necessary funding from a combination of Proposition 70, Proposition 99, and other sources to meet the State's share of the costs.
- The fishery and riparian habitat measures contained herein should be implemented in general conformance with the priorities indicated.
- State and federal legislation should be enacted to authorize an upper Sacramento River Advisory Council to facilitate implementation of the management plan.

DEVELOP THE SACRAMENTO RIVER RIPARIAN CONSERVATION AREA (SRRCA) PLAN. Conduct studies necessary to establish an inner river zone and conservation area boundaries. Complete planning necessary to identify boundaries, estimate costs, and develop legislation needed to implement the plan.

ESTABLISH THE SACRAMENTO RIVER RIPARIAN CONSERVATION AREA. Use acquisition through direct purchase, conservation easements, and transfer development rights for the protection of critical habitat areas. Additional methods of area establishment include "set-aside" agreements and tax incentives programs.

IMPLEMENT A SACRAMENTO RIVER RIPARIAN CONSERVATION AREA MANAGEMENT PLAN. SRRCA would be a legislated district managed by a governing board created and funded by Congress and the legislature. The board will

include a balanced representation of participating landowners and public interest groups.

FUNDING: Capitol costs of implementing this plan total about $240 million, with annual costs of about $9 million. Existing fund sources include:

- 1984 Fish and Wildlife Habitat Enhancement Bond (Proposition 19),
- California Wildlife, Coastal, and Parks Initiative (Proposition 70) - $4 million,
- DFG - Fisheries Restoration (AB1705) - $5 million over 2 years,
- Salmon Stamp Funds - $200,000 to $1,000,000 annually, depending on the year's catch,
- Environmental License Plate Fund - $0 - $3 million annually,
- Urban Stream Restoration Program - Up to $300,000,
- Delta Pumps Fish Protection Agreement - $15 million, and
- Cigarette and Tobacco Tax Benefit Fund Initiative (Proposition 99) - $15 million.

STATUS OF IMPLEMENTATION: Action items are in various stages of consideration, some of which are already completed or under way. Toxic drainage in Spring Creek from Iron Mountain Mine is a high- priority item, already the focus of a cleanup plan developed by the U.S. Environmental Protection Agency.

RELATIONSHIP TO OTHER PLANS: Directly related to SB2261, The Anadromous Fisheries Program Act.

CONTACT: The Resources Building, 1416 Ninth Street, Sacramento, CA 95814, (916) 445-5656.

SOURCE: The Resource Agency. 1989. Upper Sacramento River: fisheries and riparian habitat management plan. January 1989. Sacramento, CA.

UPPER SACRAMENTO RIVER FISHERIES AND RIPARIAN HABITAT MANAGEMENT PLAN JANUARY 1989

GEOGRAPHIC SCOPE: Upper Sacramento River watershed.

PURPOSE: The purpose of the habitat management plan was to develop both instream and riparian habitat actions to improve habitat on the Upper Sacramento River. The plan identified 22 action items for consideration.

TARGETS:

FISH POPULATIONS:

- Deer Creek (2,000 spring-run, 3,000 fall-run, and 1,000 steelhead).
- Butte Creek (4,000 spring-run, 2,000 fall-run, steelhead).
- Big Chico Creek (1,000-2,000 spring-run and 500 steelhead).

HABITAT RESTORATION:

- Spawning gravel restoration.
- Clear Creek- reconstruct spawning riffles below dam.
- Clear Creek- rip lower 6 miles to improve juvenile habitat.
- Big Chico Creek- gravel replenishment below Five Mile;
- Cottonwood Creek- gravel restoration on South Fork Cottonwood Creek below Dippingvat Dam and on lower Cottonwood Creek below South Fork.

STRUCTURAL:

- Red Bluff Diversion Dam modifications.
- Renovate Coleman Fish Hatchery.
- Glen-Colusa Irrigation District (GCID) Diversion.
- Unscreened Diversions.
- ACID Diversion Dam modifications.
- Clear Creek -reconstruct fish ladder at McCormick-Saeltzer Dam.
- Butte Creek - unscreened diversions, fish ladders at four dam locations.
- Big Chico Creek - relocate M&T Ranch; control structures at Five Mile; redesign One Mile Dam; redesign Iron Canyon and Five Mile fish ladders.
- Enlarge Coleman National Fish Hatchery.
- Construct a new hatchery below Keswick Dam.
- Battle Creek - screen diversions of Pacific Gas and Electric Company (PG&E) facilities.

FLOW-RELATED:

- Temperature and turbidity.
- Improve Sacramento River flow regime.
- Improve flows in Deer Creek.
- Increase flows in Clear Creek.
- Increase flows in Big Chico Creek.
- Increase bypass flow releases from project diversions in Battle Creek.

JUSTIFICATION: Senate Bill 1086.

FUNDING: 1984 Fish and Wildlife Habitat Enhancement Bond, California Wildlife, Coastal and Parks Initiative, DFG Fisheries Restoration Fund, Salmon Stamp Funds, Environmental License Plate Fund, Urban Stream Restoration Fund, Delta Pumps Fish Protection Agreement, Federal Aid in Sport Fish Restoration Program, Cigarette and Tobacco Tax Benefit fund.

STATUS OF IMPLEMENTATION: Various elements of the program have been implemented. The M&T pump station on Big Chico Creek was relocated to the Sacramento River in August 1996.

RELATIONSHIP TO OTHER PLANS: None.

U.S. FISH AND WILDLIFE SERVICE FINAL REPORT - EVALUATION OF THE SACRAMENTO RIVER SPAWNING GRAVEL RESTORATION PROJECT AND WINTER-RUN CHINOOK SALMON REDD SURVEY, 1987-1993 APRIL 1996

GEOGRAPHIC SCOPE: Upper Sacramento River near Redding.

PURPOSE: Restoration of gravels in the segment of the Sacramento River from Keswick Dam (River Mile 302) to the mouth of Cottonwood Creek (RM 273.5).

TARGETS:

HABITAT RESTORATION:

- Continue gravel replenishment program at stockpiling site Keswick (RW 302), Salt Creek (301) and Shea Levee (RM290).

JUSTIFICATION: Mitigation required for CVP operations.

FUNDING: U.S. Bureau of Reclamation and DFG.

STATUS OF IMPLEMENTATION: Project has been implemented. The final report recommends continued gravel replenishment.

RELATIONSHIP TO OTHER PLANS: Linked to the upper Sacramento River Fisheries and Riparian Habitat Management Plan.